

PLANNING & PROGRAMMING DIVISION
PLANNING RESEARCH SECTION
TRAFFIC ANALYSIS UNIT

TAU 3223-A

T.H. 10

S.P. 7102-37, 7102-38

Elk River to Big Lake

Prepared: May, 1966

MINNESOTA HIGHWAY DEPARTMENT

U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

DEPARTMENT HIGHWAY

STATE OF MINNESOTA

Office Memorandum

TO : D. J. Aune
District Engineer - Brainerd

DATE: May 9, 1966

FROM : R. D. Owens
Traffic Analysis Engineer

SUBJECT: T.H. 10; S.P. 7102-37, 7102-38;
Elk River to Big Lake

This report is in response to E. W. McCullough's March 9, 1966, request for 1968 traffic data for the project location shown on the map on page 2.

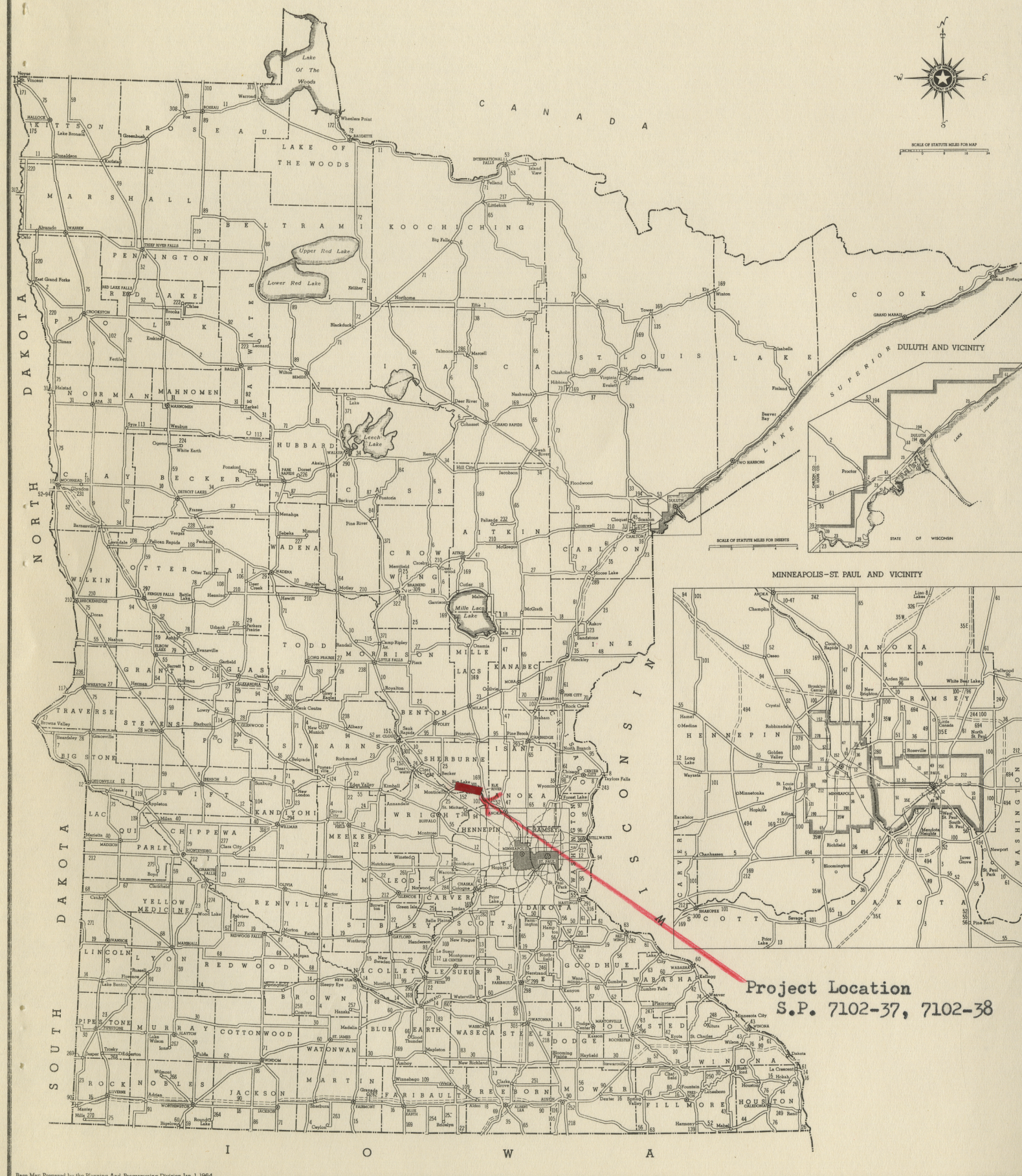
This report was requested because during the summer of 1968 the east-bound lane, which is now bituminous, will be rebuilt. The west-bound lane, which is now concrete, will not be rebuilt and will have to carry the traffic for both the east-bound and west-bound lanes during the summer of 1968.

The principle concern stated in the request for this report was the ability of the west-bound lane to carry the total traffic for both lanes during the period of construction. McCullough fears the following considerations further complicate the capacity problem of the west-bound lane. During the summer of 1968 T.H. 94 will not be done from St. Cloud to Minneapolis. T.H. 169 from Lake Fremont to Princeton will also be under construction in the summer of 1968.

cc:
T. S. Thompson - 612

R. D. Owens

STATE OF MINNESOTA
DEPARTMENT OF HIGHWAYS
WORK MAP



Basic Data, Method, and Assumptions

One of the concerns prompting the request for this report was that during the summer of 1968 T.H. 10 would, in addition to its normal load of traffic, carry some diversions from T.H. 169 for trips contacting both Elk River and points in Crow Wing County. Now the "Weekly Road Condition Maps" for July 6, 1965, through September 16, 1965, show T.H. 169 "under construction, some delay and interference" from Elk River to Lake Fremont. The construction consisted of changing the two-lane to a four-lane divided which now appears on the "1966 Official Highway Map".

There is a continuously operated traffic counting machine situated on T.H. 169 south of Onamia. Examination of the following records for the construction period in 1965 and this period in previous years shows no effect up there of the construction between Elk River and Lake Fremont in 1965.

T.H. 169 South of Onamia

Year	←construction period→			
	June	July	August	September
1960	3719	4723	3965	3126
1961	4100	4483	4148	3268
1962	4283	4439	4117	3128
1963	4474	4945	4497	3182
1964	3879	4508	3994	3090
1965	3433	4491	4413	3166

Unfortunately, other than the foregoing automatic traffic recorder counts, there were no counts made on any roads in Sherburne and Mille Lacs counties in 1965. But, the counts south of Onamia are a reasonable indicator of the seasonal and yearly trends south of Princeton. The assumption is that there will be a negligible diversion of traffic from T.H. 169 to T.H. 10 in the summer of 1968.

The tourist travel on T.H. 152 from Minneapolis to Waite Park is mostly oriented toward points west of Waite Park. An alternate route for the tourists on T.H. 152 is T.H. 55 in combination with one of its radial routes to the north. More likely, most of the T.H. 152 travel will continue to use it during the construction of parallel T.H. 94.

The conclusion is that the travel in 1968 on the subject section of T.H. 10 is assumed to be only an extrapolation of the past 12 years traffic data for the project. Hence, the 1952, 1964, and 1968 Average Annual Daily Traffic on T.H. 10 just west of Elk River are 6,318, 7,610, and 8,042, respectively. This 8,042 is an average for all 365 days of the year, and it will have to be converted to an average for the 92 days in June, July, and August. Since there is no continuously operated traffic counting machine on T.H. 10 between Elk River and St. Cloud, this conversion was accomplished through use of the monthly relationships recorded for T.H. 10 between Anoka and Elk River in 1965 where it was found to be 1.31 based on the following data.

June	17150	per day for 30 days
July	20024	" " " 31 "
August	19930	" " " 31 "

$$57104 \div 3 = 19034 \text{ per day for 92 days}$$

ADT 14482 per day for 365 days

$$19034 \div 14482 = 1.31$$

Application of this 1.31 to the 8,042 computed in the previous paragraph yields a 1968 summer day travel of 10,535 for the project.

The DHV in the automatic traffic recorder records is always given as a percentage of the average of the travel for all 365 days. The DHV for T.H. 10 between Anoka and Elk River was recorded as 16.9%, 16.3%, 14.5%, and 15.7% for 1962, 1963, 1964, and 1965, respectively. The average for the four years is 15.8%, and application of this 15.8% to the 8,042 average traffic for the 365 days yields a DHV of 1,271, whose directional distribution was calculated to be 65-35 by using the directional hourly counts between Anoka and Elk River during the 30th peak hour.

To conclude, the facility is four-lane divided, and the request was made to see if the two west-bound lanes could take care of the traffic normally carried by all four lanes during construction in 1968. Historically, the ADT has been about the same for the whole project. Some years the east end has been 200 higher than the west end and other years the reverse has been noted on the traffic map. Therefore, one set of figures presented without a map serves the purpose of the request. These figures are recapitulated as follows:

1968 ADT	8042
DHV	15.8%
1968 DHV Volume	1271 with a 65-35 split
1968 summer day	10535

This 1,271 is most apt to occur on a Friday, Sunday, or a holiday during the summer days when the average travel per day is 10,535.

It should be noted that on page 76 of the 1965 Highway Capacity Manual the cited maximum capacity of a two-lane, two-way highway is a 2,000 per hour total for both directions under ideal conditions. This 2,000 assumes 1,000 in each direction. The 1,000 is comparable to the directional split of the 1,271 DHV which is 825. It is therefore imperative that high capacity connections would be provided to the two-lane section from each end of the project.